

UC Berkeley  
Department of History

History 180  
Fall 2003

The life sciences  
since 1750  
J. E. Lesch

Schedule of lectures

8/25 Introduction

I From natural history to biology

8/27 Before natural history

8/29 The systematic spirit: botany

9/1 Holiday

9/3 The systematic spirit: the botanical model in science and medicine

9/5 Popular natural history

II Evolution

9/8 18th-century background; Lamarck and Cuvier

9/10 Geology: catastrophism vs. uniformitarianism

9/12 Darwin's path to the Origin: the voyage of the Beagle

9/15 Darwin's path to the Origin: natural selection

9/17 Evolution in biology and late 19th-century thought

III The organizational transformation of science

9/19 France

9/22 Germany

9/24 Britain

9/26 United States

9/29 **Midterm examination I**

IV Travel, exploration, and discovery

10/1 Cook and the Pacific

10/3 The naturalist's voyage: Humboldt, Wallace

10/6 No lecture

10/8 Exploration of the American West I

10/10 Exploration of the American West II

V The cell

10/13 The microscopic world

10/15 Cell theory: origins

10/17 Cell theory: extension

VI Physiology

- 10/20 Medical origins
- 10/22 Experimentalism
- 10/24 The physical sciences and life
- 10/27 Consolidation
- 10/29 New directions in the early 20th century

10/31 **Midterm examination II**

VII Genetics

- 11/3 Approaches to heredity 1860-1900
- 11/5 Toward a synthesis
- 11/7 The foundation of classical genetics
- 11/10 Molecular genetics: origins
- 11/12 Molecular genetics: DNA
- 11/14 The double helix

VIII The biomedical-industrial complex

- 11/17 Science, medicine, and industry: a 20th-century pattern
- 11/19 Origins of chemotherapy: industrial science
- 11/21 No lecture
- 11/24 Origins of chemotherapy: bacteriology
- 11/26 The sulfa drugs
- 11/28 Holiday
- 12/1 Penicillin
  
- 12/3 Review discussion
- 12/5 Review discussion

**12/10 12:30-3:30 Final examination**

Organization and assignments

Reading. All of the assigned reading may be found on reserve at the Moffitt Library reserve desk. Much of the reading is in the History 180 Reader, which will be on reserve at the Moffitt reserve desk and will also be available for purchase at Ned's Berkeley Bookstore, 2476 Bancroft Way (across from the campus) beginning Monday, August 25. The following books may be purchased:

- Peter J. Bowler, Evolution: The History of an Idea (California)
- Charles Darwin, Autobiography. Nora Barlow, ed. (W. W. Norton)
- Thomas S. Kuhn, The Structure of Scientific Revolutions. Second or third edition (Chicago)
- James D. Watson, The Double Helix. Norton Critical Edition, edited by Gunther Stent (W. W. Norton)

Examinations, papers, and grades. A three-page summary of Thomas S. Kuhn's The Structure of Scientific Revolutions will be due on Wednesday, September 17. There will be two midterms and one final examination. Twenty-five percent of the course grade will be determined by each of the

midterms, and fifty percent by the final examination. Students who wish to do so may substitute an eight-page paper for the essay part of the final examination. This paper will be worth one half the value of the final exam, or twenty-five percent of the course grade. **It will be due on Wednesday, December 3. This course is in exam group 2, so the final examination will be held Wednesday, December 10, 12:30-3:30 p.m.**

#### Aids for further study

##### Biography

Dictionary of Scientific Biography (available in Moffitt Library reference area and the Doe Library reference room)

##### Bibliography

Judith Overmier, The History of Biology: An Annotated Bibliography  
Pieter Smit, History of the Life Sciences: An Annotated Bibliography  
Bibliography of the History of Medicine  
Current Work in the History of Medicine  
Isis Cumulative Bibliography 1913-1965; Isis Cumulative Bibliography  
1965-1975; Isis Cumulative Bibliography 1975-1985; and  
subsequent yearly Critical Bibliography

All of the above except the Isis Cumulative Bibliography are available in the Biosciences Library. The Isis Cumulative Bibliography may be found in the reference room of Doe Library and in the Office for History of Science and Technology, 470 Stephens Hall. In addition to these publications, a History 180 course bibliography, listing supplementary readings for the topics covered in this course, will be available starting in the first week of class.

##### Journals (a selected list)

British Journal for the History of Science  
Bulletin of the History of Medicine  
Historical Studies in the Physical and Biological Sciences  
History and Philosophy of the Life Sciences  
History of Science  
Isis  
Journal of the History of Biology  
Journal of the History of Medicine and Allied Sciences

##### Online

If you would like to search for books or articles related to the history of the life sciences, you can find a guide to online resources at

[http://ohst.berkeley.edu/Teaching/101S\\_resources.html](http://ohst.berkeley.edu/Teaching/101S_resources.html)

When you go to this site, scroll down to the section: How do you get into the secondary literature?

##### Required reading by topic

## I From natural history to biology

Thomas S. Kuhn, The Structure of Scientific Revolutions (complete).  
Reader, pages TBA (selection by Keith Thomas).

## II Evolution

Peter J. Bowler, Evolution, pp. 1-245 [Note: the page numbers given for this book refer to the second edition. Appropriate page numbers for the new third edition will be distributed in class].

Charles Darwin, Autobiography, pp. 11-145.

Richard D. Keynes, The Beagle Record, pp. 22-24, 27, 31-32, 36-40, 68-70, 138-142, 248-250, and look at the pictures (Moffitt reserve).

Alan Moorehead, Darwin and the Beagle. Look at the pictures (Moffitt reserve).

Reader, pages TBA (selections by Jean-Baptiste Lamarck, Georges Cuvier, Charles Lyell).

## III The organizational transformation of science

John Theodore Merz, A History of European Scientific Thought in the Nineteenth Century, Volume 1, pp. 89-301 (Moffitt reserve).

William Coleman, Biology in the Nineteenth Century, pp. 1-8 (Moffitt reserve).

Reader, pages TBA (selections by W. V. Farrar, Joseph Ben-David).

## IV Travel, exploration, and discovery

A. Grenfell Price, ed., The Explorations of Captain James Cook in the Pacific, pp. v-xvii, 1-21, 63-85 (Moffitt reserve).

Reader, pages TBA (selections by David Mackay, Alfred Russel Wallace, William Goetzmann).

## V The cell

William Coleman, Biology in the Nineteenth Century, pp. 16-34 (Moffitt reserve).

Reader, pages TBA (selections by Erik Nordenskiöld, François Jacob, Theodor Schwann, Rudolf Virchow, Edmund B. Wilson, Jane Maienschein).

## VI Physiology

William Coleman, Biology in the Nineteenth Century, pp. 118-159 (Moffitt reserve).

John E. Lesch, Science and Medicine in France: The Emergence of Experimental Physiology 1790-1855, pp. 12-30, 99-124 (Moffitt reserve).

Garland Allen, Life Science in the Twentieth Century, pp. 73-111 (Moffitt reserve).

Reader, pages TBA (selections by Claude Bernard, Paul Cranefield, Walter Cannon).

## VII Genetics

Peter J. Bowler, Evolution, pp. 246-281, 291-296, 307-332.

Garland Allen, Life Science in the Twentieth Century, pp. 1-19, 41-72, 126-145, 187-228 (Moffitt reserve).

James D. Watson, The Double Helix (complete)

Reader, pages TBA (selection by Diane B. Paul and Barbara A. Kimmelman).

And one of the following:

Donald Fleming, "Emigré physicists and the biological revolution," in Donald Fleming and Bernard Bailyn, eds., The Intellectual Migration: Europe and America 1930-1960, pp. 152-189 (Moffitt reserve).

or

François Jacob, The Logic of Life, Chapter 5, "The molecule" (Moffitt reserve).

or

Erwin Schrödinger, What is Life?, Chapters 4-7 and Epilogue (Moffitt reserve).

#### VIII The biomedical-industrial complex

Harry F. Dowling, Fighting Infection: Conquests of the Twentieth Century, pp. 105-157 (Moffitt reserve).

Reader, pages TBA(selections by Hubert A. Lechevalier and Morris Solotorovsky, Alfred Gilman, Ernst B. Chain, Kendall Birr, James Harvey Young).